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Chemistry and Soils and Agricultural Engineering. Not for publication. I VED
U.S.D.A.

U.S. Department of culture

Vol. I.

May 25, 1939

No. 5

Dr. Henry G. Knight delivered an address at the annual meeting of the National Cottonseed Products Association at New Orleans, La., his subject being "Cottonseed Research Acquires National Significance." Dr. Knight said that since cotton is the major surplus crop of the South, the Southern Regional Research Laboratory to be established in New Orleans will undertake research to develop the potential industrial possibilities of the crop. In this new research program all the products of the cotton pland and the plant in its entirety will be studied intensively for the first time in the history of this country.

Henry A. Donovan, Business Manager of the Bureau, spent April 28 and 29 at the office of the New Orleans Regional Research Laboratory inspecting the business methods and office procedure in use at the temporary headquarters in the Queen and Crescent Building. Mr. Donovan reports that the quarters selected seem suitable for the staff and that the work is in splendid condition from an office standpoint

Miss Lillian M. Church, an employee of the Department of Agriculture since 1904, died on May 13, 1939.

Miss Church was first employed by the Bureau of Plant Industry as a clerk, next as an assistant in farm accounting in the Office of Farm Management and was transferred to the Division of Agricultural Engineering, Bureau of Public Roads, when that Division (later the Bureau of Agricultural Engineering) was organized in 1916. She was author or joint author of 14 publications of the Department and of a number of mimeographed reports. At the time of her death she was engaged in compiling histories of a number of different classes of farm machines.

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CHEMICAL ENGINEERING RESEARCH DIVISION

Dr. David J. Price went to Chicago on May 5 to attend the annual meeting of the National Fire Protection Association of which he is Vice-President. As chairman of the Dust Explosion Hazards and Farm Fire Protection Committees, Dr. Price presented the annual committee reports.

On May 9 at Chicago Dr. Price addressed the Midwest Safety Conference on "Some Aspects of Dust Explosion Prevention in Industrial Plants". In connection with his address he showed the Bureau's motion picture "Dangerous Dusts".

Hylton R. Brown left Washington on May 1 for Detroit, Mich., where he addressed the annual meeting of the Building Officials' Conference of America on "Design and Construction of Buildings Subject to Dust Explosion Hazards." From Detroit Mr. Brown went to Cedar Rapids, Iowa, for conferences with officials of the Quaker Oats Co. on dust explosion prevention. Returning to Chicago, Mr. Brown, who is secretary of the Dust Explosion Hazards Committee of the National Fire Protection Association, attended the annual meeting of that Association. He then went to Milwaukee, Wis., for conferences with officials of the Krause Milling Co., and to Minneapolis, Min., for further conferences. He addressed the 12th annual meeting of the Northwest Fire School on "Protection Against Dust Explosions a Part of the Fire Prevention Work of the U. S. Department of Agriculture".

While Dr. Price, H. R. Brown, and H. E. Roethe were attending the annual meeting of the National Fire Protection Association in Chicago, a disastrous dust explosion and fire occurred in the Rosenbaum Brothers Grain Company's elevator. As a result of that explosion 10 lives were lost, 44 persons were injured, and property damaged to the extent of \$4,000,000. The explosion afforded an unusual opportunity for direct investigation immediately following the occurrence, the Bureau's representatives reaching the scene of the disaster within three hours. The fire extended to four other elevators, resulting in what is regarded as the most disastrous grain elevator dust explosion and fire in the United States. Messrs. Price, Brown, and Roethe are cooperating with State, municipal, and insurance officials in the investigation of the explosion.

Harry E. Roethe, secretary of the Farm Fire Protection Committee and the Committee on Spontaneous Heating and Ignition of the National Fire Protection Association, also attended that Association's annual meeting in Chicago. His itinerary from Chicago included Madison and Fort Atkinson, Wis., where he conferred with a number of persons on the spontaneous heating and ignition of hay, and on other matters relating to farm fire protection.

Mr. Brown and Byron J. Culp cooperated with a representative of the Walter Kidde Co. of New York in running tests at the Arlington testing station on the turbulence created by various types of nozzles used for the dissemination of high-pressure carbon dioxide when nozzles are directed at concentrations of dust.

Mr. Culp attended a meeting on April 26 of the full committee on Inspection and Interdepartmental Cooperation of the Federal Fire Council. Among other things, the committee submitted a simplified inspection form which it voted to present to the Federal Fire Council for adoption.

Theodore R. Naffziger was elected to associate membership and David A. Colker to junior membership in the American Institute of Chemical Engineers.

* * *

COTTON GINNING LABORATORY

The high density packaging project at the U. S. Cotton Ginning Laboratories has been making some tests at cotton compresses in New Orleans, and by means of round-edged steel inserts has produced a number of very interesting bale cuts during compression of cotton bales from farm size to domestic and export shipping densities. A joint crew of members from both the Engineering and Economic's staff participated in this work.

On Friday, May 5, Chas. A. Bennett visited New Orleans for conferences with the compress testing unit, and on May 6 conferred with officials of the Houston Compress Co. at Houston, Texas, returning to Stoneville on May 7.

On May 10 Mr. Bennett and V. L. Stedronsky attended the second annual convention of the National Compress and Warehouse Association, where Mr. McCrory was to have appeared on the program but was prevented by illness. The staff of the Cotton Ginning Laboratories conferred with officials of the Association and arranged for cooperative studies in connection with the Bankhead-Jones packaging project at compresses at Memphis and other points.

Relocation and outfitting of the long staple roller ginnery laboratory in cooperation with the Bureaus of Agricultural Economics and Plant Industry is virtually completed, and a rebuilt double roller Foss gin is now being set up for tests. It is expected that Sea Island cottons will be trucked to the Laboratories from convenient points in Louisiana and Georgia during the tests.

Several new 1939 model improved all steel cotton gin stands have been placed in the Ginning Laboratories by the manufacturers in exchange for older models. These exchanges are very valuable for experimental and informative purposes and by the cooperation of the manufacturers have enables the Cotton Ginning Laboratories to keep fully informed regarding the latest developments in construction and performance.

Messrs. Bert Barre and Henry Spielman of the Agricultural Adjustment Administration visited the U. S. Cotton Ginning Laboratories during the week of May 8 to 13 in connection with inspection of cotton gins for a proposed cotton export program. The Mississippi Extension Ginning Specialist and the staff of the Laboratories are working with these parties in furthering the general objectives of the Department.

Several modernized cotton gins are being purchased by ginners in the Mississippi Delta and several purchasers have consulted the Laboratory staff in preparing their specifications for new ginning outfits.

NAVAL STORES RESEARCH DIVISION

- W. D. Pohle went to Baltimore, Md., on April 17, to discuss the use of rosin in soap with the chemists of Lever Brothers. Mr. Pohle spent April 24 26 at the plant of Fels and Co., Philadelphia, Pa., where he made a series of detergent tests on rosin soaps.
- C. F. Speh visited Swann and Co. of Birmingham, Ala., and Taylor, Lowenstein and Co. of Mobile, Ala., to discuss proposed cooperative work on fractionation of turpentine. On April 11 he went to Chillicothe, Ohio, to confer with Dr. H. C. Schwalbe of the Mead Corporation, on the use of rosin in paper sizing. From Chillicothe he went to Pittsburgh, Pa., to discuss naval stores matters with representatives of Mellon Institute.
- E. L. Patton and N. C. McConnell of the Naval Stores Station spent several days during April at the plant of Taylor, Lowenstein and Co., Mobile, Ala., where they rendered assistance in the construction of the first model fire still built entirely in accordance with Government plans.

INDUSTRIAL FARM PRODUCTS RESEARCH DIVISION

Dr. Henry G. Knight, Chief of the Bureau and C. E. Senseman, Acting Chief of the Industrial Farm Products Research Division, visited the Agricultural By-Products Laboratory at Ames, Ia., on April 28 and 29 to attend the meeting of the Advisory Board of the laboratory.

T. R. McElhinney was on official business recently in Detroit, Mich., Chicago and Urbana, Ill., in company with Dr. S. I. Aronovsky. They visited a number of plants and laboratories in connection with the plastics work of the Agricultural By-Products Laboratory.

Dexter C. Buell of the Railway Educational Bureau, Omaha, Nebr., visited the Agricultural By-Products Laboratory on May 3. Mr. Buell was greatly interested in the work being done on the industrial utilization of agricultural waste materials.

- Dr. S. I. Aronovsky and Dr. R. P. Straka, spent a day at the strawboard mill of the Central Fibre Products Co., Tama, Iowa, discussing with the officials of this plant the problem of slime control in the mill.
- Dr. A. J. Stamm of the Forest Products Laboratory, Madison, Wis., visited the Agricultural By-Products Laboratory on May 8 during his American Chemical Society speaking tour.

The Collaborative Committee of the U. S. Regional Soybean Industrial Products Laboratory met at Urbana, April 20-22, to plan the

research program for the coming year and hear reports of the work for the past year. The committee is composed of twelve representatives from the Agricultural Experiment Stations of the North Central States. Also attending the meeting were C. E. Senseman, Acting Chief of the Industrial Farm Products Research Division, and W. J. Morse, Senior Agronomist of the Bureau of Plant Industry.

Dr. R. T. Milner, Acting Director, and Dr. K. S. Markley, Senior Chemist of the Soybean Laboratory, attended the meetings of the American Oil Chemists' Society at New Orleans, May 5-6. Papers entitled, "Relation between the Iodine Number and Refractive Index of Crude Soybean Oil," and "The Chemical Composition of Some High-Iodine-Number Soybean Oils," were presented by Dr. Milner and Dr. Markley, respectively.

Among the visitors to the Soybean Laboratory during April were Dr. D. K. Baird, Imperial Chemical Industries, Ltd., Glasgow, Scotland; T. Matoba, Iwai and Company, Ltd., New York, N.Y., T. Hidaka, Dai Nippon Celluloid Company, Sakai, Japan; and M. E. Greenwood of Swift and Co., Rosario de Santa Fe, Argentina.

P. Burke Jacobs spent a week at Peoria, Ill., conferring with officials of the Northern Regional Research Laboratory and with officials of the Century Distilling Co., the Hiram Walker and Sons Co., the Commercial Solvents Corporation, and other commercial concerns in Peoria and vicinity on matters relating to motor fuel work of the Division.

* * * FIBER FLAX INVESTIGATIONS

According to W. M. Hurst, the State Flax Industry of Oregon has requested permission to use a tow shaker developed at Corvallis as a model in constructing three or four such machines for their use at Salem, Oregon. The new shakers are to replace some heavy expensive equipment now in use.

An experimental fiber flax deseeder which was recently given preliminary tests gave premising results. A test run on one load of flax bundles indicated a capacity of nearly three tons per hour, which is approximately twice the capacity of deseeders now in use. This machine designed by M. C. Widger, was constructed in the Corvallis, shop.

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DIVISION OF MECHANICAL EQUIPMENT

A design for a carriage to be used in studies of draft of cultivators and other implements used in weed control is being worked out by E. M. Dieffenbach whose headquarters is at Logan, Utah. The carriage

will resemble the chassis of a four-wheeled trailer, with places provided for making attachments as desired.

S. W. McBirney reports that a third set of mechanically blocked sugar beet plots was put in at Davis, Calif., on a plot of late strip plantings, seeded with different single seed and conventional planters. The final stands on these plots, with the exception of the check plots, are obtained without finger thinning and at about half the usual cost of hand blocking and thinning.

A 16 mm. motion picture film is being made to illustrate the work on single-seed planting and mechanical blocking and thinning of sugar beets. This film shows the types of single seed drop mechanisms being used, the laboratory method of determining the uniformity of seed drop, the field germination stands obtained and the equipment and methods being investigated for mechanizing the beet thinning.

- G. A. Cumings, in connection with fertilizer placement experiment with cannery peas at Geneva, N.Y. conferred with Director Parrott, of the New York Agricultural Experiment Station, on April 27. He supervised the fertilizer placement operations at Geneva on April 28.
- W. H. Redit, on completion of fertilizer placement work with cotton and soybeans in Mississippi, inspected the shade tobacco experiment on May 3 at Attapulgus, Ga. In comparative trials under adverse moisture conditions the number of plants replaced in three replantings where the fertilizer was applied broadcast as locally practiced, was greater than the number first transplanted while only about one-fourth as many plants died where the fertilizer was placed in a band at each side of the row.
- L. G. Schoenleber and D. B. Eldredge have been engaged on planting operations in cooperative studies of various methods of applying fertilizer to sugar beets in Michigan and Ohio.

The following publication has just been issued:

Cumings, G. A., and Houghland, G.V.C., "Fertilizer Placement for Potatoes". U. S. Dept. Agr. Tech. Bull. 669, 48 pp., illus.

ALLERGEN INVESTIGATIONS

Dr. Henry Stevens and Dr. Harry S. Bernton attended the meetings of the American Society for the Study of Allergy in St. Louis, Mo., May 15 to 17, inclusive. A paper on "The Significance of Cottonseed

Sensitiveness" by Harry S. Bernton, Joseph R. Spies and Henry Stevens was presented by Dr. Bernton.

* * *

DIVISION OF STRUCTURES

W. R. Humphries has completed a preliminary survey of farm storage of grain sorghum which covered parts of Kansas, Oklahoma, Texas, and New Mexico. Most of the sorghum stored on farms was in good condition. Much of it was in piles or ricks not under a roof or other protection. The highest moisture content observed was about 14 percent but most of the grain had only 10 to 12 percent moisture. Mr. Humphries also made a study of types of grain storages. In the regions visited grain could be left out of doors over the winter months without loss in quality. Such a practice of course might result less fortunately in seasons of extreme precipitation, especially with snow.

One type of bin popularly used for grain storage is the railroad boxcar or refrigerator car. The latter is insulated at ceiling
and sides and equipped with roof ventilators at each end. It holds
upward of 2,000 bushels of grain and entails a farm investment of from
\$75 to \$100 set up on pier foundation.

J. R. McCalmont has completed the wheat drying machine at Arlington to the point where a preliminary drying test has been run on a quantity of wheat. The oil burners prove much more satisfactory than the coal stove which was used last year. A heated drum similar to that formerly used was employed, but in the present machine the wheat is exposed to the drying air in much thinner layers. Air is also blown through the drum in which the wheat is heated.

The survey of farm corn storage in the noncommercial corn producting area is being completed. W. O. Swanson has visited the States south and east of the Corn Belt in which the corn storage problem is important. Dr. Barre conducted the survey in part of Missouri. This work supplements similar but more intensive observations in the Middle West.

In response to the series of radio broadcasts on farmhouse improvement over 10,000 requests for bulletins on farm buildings were received in March. Many are still coming and an analysis of the source of demand for this material is being made.

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FERTILIZER RESEARCH DIVISION

Dr. C. H. Kunsman has just been notified of his appointment as a member of the Advisory Council on Applied Physics of the American Institute of Physics, Incorporated, for the year 1939 and until the close of the first meeting of the Governing Board held in 1940.

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On April 14 to 22, Dr. Sterling B. Hendricks of this Division, with Dr. Lyle B. Alexander of the Bureau of Plant Industry, visited Rutherfordton, N.C., Gainesville, Ga., Spruce Pine, N.C., and vicinities for the purpose of collecting and examining in place, soils and soil forming minerals of Cecil and Davidson soils in connection with fertilizer investigational work dealing with the mineral composition of soil colloids.

During the meetings of the American Geophysical Union held in Washington April 26-28, Dr. Oliver R. Wulf gave an extemporaneous talk on "The Photochemical Origin of Atmospheric Ozone and the Circulation of Air in the Lower Atmosphere".

On May 3 Dr. Kunsman, Dr. W. H. Ross, K. D. Jacobs, J. O. Hardesty, and W. L. Hill, visited the Davison Chemical Corporation of Baltimore, Maryland, where they inspected the commercial equipment of their granulating plant, the experimental and research work for which process was done in this Division. It was learned that half of their superphosphate is now being sold in a granulated form, and also that a considerable tonnage of mixed fertilizer materials is also sold in a granulated form.

Frank O. Lundstrom, president of the Washington Chapter of the American Institute of Chemists submitted the Chapter's Annual Report at the 17th Annual Meeting held in the Science Building of the Worlds Fair in New York, Saturday, May 13. After a most successful meeting the members of the Institute greatly enjoyed a tour of the Worlds Fair grounds personally conducted by Dr. Gerald Wendt, a Fellow of the Institute and Director of Science and Education at the Fair.

On May 11, Dr. A. K. Brewer delivered an article entitled
"The Application of the Mass Spectrograph to the Study of Isotope
Abundance and Atomic Weights" before the 511th meeting of the Chemical
Society of Washington (local section of the American Chemical Society),
which was held in the Auditorium of the Engineering Building, University of Maryland, College Park, Md.

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CARBOHYDRATE RESEARCH DIVISION

- Dr. G. S. Jamieson presented a paper entitled "Ben (Moringa) Seed Oil" at the annual convention of the American Oil Chemists' Society held in New Orleans, La., May 5-6.
- R. T. Balch and Dr. W. O. Gordon arrived in Washington, D. C. on May 15 for conference relative to work being done at the Laurel Starch Plant, Laurel, Miss., regarding dehydration of sweetpotatoes in connection with production of sweetpotato starch. Before returning to Laurel they will visit a number of points in Pennsylvania,

Massachusetts, Ohio, Iowa, Michigan and Kentucky to obtain information regarding certain types of equipment needed for the dehydration plant at Laurel, Miss.

The two new laboratories being equipped at Bogalusa, La., and Gainesville, Fla., for research work on tung oil are expected to be ready about July 1. The work of equipping these new laboratories is under the immediate supervision of Dr. R. M. McKinney.

RURAL ELECTRIFICATION INVESTIGATIONS

Harry L. Garver attended the Fifth Annual Rural Electrification Training Course offered by the Pennsylvania State College, State College, Pa., and gave a paper entitled "Present Day Practices on Electrified Dairy Farms".

Mr. Garver is author of a bulletin, just issued, entitled "Some Things a Farmer Should Know About Electricity," issued by the State College of Washington as Popular Bulletin No. 157.
Mr. Garver was connected with the Washington State College before coming to Washington.

PROTEIN AND NUTRITION RESEARCH DIVISION

Dr. F. A. Csonka attended the meetings of the American Society of Biological Chemists, held at Toronto, Canada, April 26 to 29.

FOOD RESEARCH DIVISION

The U. S. Citrus Products Station at Winter Haven, Fla., was recently honored with a visit from Dr. Charles W. Dabney, Jr., Dr. Dabney was Assistant Secretary of Agriculture between 1893 and 1897 and later President of the University of Cincinnati. He was the first Secretary-Treasurer of the Association of Official Agricultural Chemists (1885), and was later made Vice-President. Although now 84 years old, Dr. Dabney still takes an active interest in agricultural chemistry.

During his recent visit to Washington, His Excellency, General Anastasio Somoza, President of the Republic of Nicaragua, accompanied by a party of officials, visited this Department. Secretary Wallace assigned Dr. E. N. Bressman, his Scientific Advisor, to point out a few of the interesting developments in the Department to President Somoza and his group, including Dr. Manuel Cordero Reyes, Minister of Foreign Affairs of Nicaragua; Honorable Leon De Bayle, Minister of Nicaragua at Washington; Mr. Laurence Duggan, Chief of the Division of American Republics of the State Department; and Mr. G. A. Drew, also of the Division of American Republics. Dr. Chas. E. Sando of

the Food Research Division was requested to prepare a special exhibit in his office representing the specimens so far preserved by embedding in methacrylate plastic and by Mr. G. R. Fessenden's method of plant preservation. The visitors expressed great interest in this investigational work and the specimens exhibited to them.

- J. A. Berry, of the Frozen Pack Laboratory at Seattle, Wash., attended the Corvallis Lockermen's Convention at Corvallis on April 24-25, upon request, and gave an informal address on the investigations on frozen pack fruits and vegetables being conducted at the Seattle station.
- L. H. Bailey and Dr. W. S. Hale will attend the meeting of the American Association of Cereal Chemists at Kansas City, Mo. on May 22-26, presenting papers on "Effect of Storage Temperatures Upon the Viability and Baking Properties of Compressed Yeast" and "The Proteinase in Wheat Flour", respectively.

An article entitled "Photochemical Studies of Rancidity: Chlorophyll Values as A Means to Estimate the Stability of an Oil or Fat", prepared by M. R. Coe of the Food Research Division, was read at the May meeting of the American Oil Chemists' Society in New Orleans.

A trip was made to Geneva, N.Y., during the first week of May, by Dr. F. C. Blanck and Dr. Harry E. Goresline, for the purpose of tasting various samples of fruit juices. Conferences were held with members of the Food Research Division Laboratory and officials of the Agricultural Experiment Station relative to the investigational work on fruit juices being carried on at Geneva.

Mr. Horace Campbell, of the Frozen Pack Laboratory at Seattle, was invited to attend a meeting held by the Hotel Management Association and Washington State College Home Economics Department, at Pullman, Wash., on April 29. He gave an informal address on the frozen pack industry.

An extended trip to Texas and the West Coast is being made by H. W. von Loesecke, of the U. S. Citrus Products Station at Winter Haven, Fla. At Weslaco, Texas, he will spend some time studying various angles of the citrus utilization problem, especially with regard to waste disposal. Mr. von Loesecke intends to visit plants in Los Angeles where work on citrus products is being conducted; and while in Seattle will observe the extensive development of the frozen pack industry in the Pacific Northwest.

D. A. Wheeler attended the meeting of the American Oil Chemists' Society and the National Cottonseed Products Association, in early May, presenting a paper on methyl cleate, prepared in cooperation with Mr. Riemenschneider, at the former meeting.

A paper entitled "Methods of Analysis and Their Application to Highly Purified Methyl Oleate and Methyl Linoleate", by R. W. Riemenschneider and Mr. Wheeler, was presented by the former at the meeting of the Oil Chemists' and the Cottonseed Products Association, in New Orleans. Also in attendance at these meetings was W. H. Baldwin who gave a paper on "Hydrolytic Treatment of Cottonseed Hulls", prepared by Mr. Baldwin and Dr. J. A. LeClerc. Messrs. Riemenschneider and Baldwin are Research Fellows of the National Cottonseed Products Association, carrying on investigational work under the supervision of the Food Research Division.

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Changes in Personnel

Recent Appointments (Indefinite or Probationary)

Mrs. Mary M. Baxter	Asst. Clerk-Steno	Fond Research Div.
William Y. Cory	Jr. Laborer	
	(Stoneville, Miss.)	Colton Ginning
Jessie Griffin	Unskilled Laborer (Part-	
	time)(Stoneville, Miss.)	17 11
Dean K. Fuhriman	Agent (Provo, Utah)	Irrigation
Carlo J. Mazzelli	Jr. Clerk-Typist	Bus. Admin. Div.
James Turnbull	Jr. Civil Engineer	Drainage - CCC

Recent Appointments (Temporary)

Samuel George King	Electrician (Part-time)	Cotton Ginning
	(Stoneville, Miss.)	
William McLeod McInnis, J.	r. Tinner's Helper	
	(Stoneville, Miss.)	u u
Othie Robert McMurry	Skilled Laborar (Part time)
	(Ames, Iowa)	Mechanical Equipment
Ben Duncan Moses	Sr. Research Agricultural	
	Engineer (Davis, Calif.)	Rural Electrification

Separations

Johan V. Aardweg	Forema	n (Sto	neville,	Miss.)Cotto	on Gir	ming		
Mrs. Mary L. Bly	Junior	Steno			Plan	s and	Servi	ce	
Mrs. Lillie C. Bryan	Junior	Clerk	-Typist		Reg.	Res.	Labs.	(Admin.	.)
Mrs. Myrtle G. Dent	11	It	11		11	11	11	11	
Ethel C. Griffin	11	11	tt		17	11	11	11	
Ann C. Granger	Senio:	r Sten	0.		Admin	nistra	ation		
Mrs. Mildred S. Hofer	Junio:	r Cler	k-Typist		Reg.	Res.	Labs.	(Admir	1.)
Herbert Keasley	Minor	Mecha	nic (Fire	eman)	Fert:	ilizer	· Res.	Div.	
Claire A. Keimer	Jr. C	lerk-T	ypist		Reg.	Res.	Labs.	(Admin.)
Joel Koehl	Asst.	Mech.	Engr.		Plans	s and	Servi	ce	

Separations (Continued)

John W. Kuhnel Marye Louise Lauman

manual at the

Emil L. Schneider Ruth Selsky Regimand J.Simonton James C. Smith S. Milbourn Snead

* 2 Jan 19 to the cold the last

Carl White

Asst, Civil Engr. (Monon, Ind.) Drainage Jr. Clerk-Typist William D. McCartney Carpenter (Part-Time) (Stoneville, Miss.) Mechanical Draftsman Jr. Clerk-Typist Mechanical Draftsman Chief Mechanical Draftsman Engineering Aide (Part-time) (Auburn, Ala.)

Asst. Mechanical Engineer

Reg. Res. Labs. (Admin)

Cotton Ginning Plans and Service Reg. Res. Labs. (Admin) Plans and Service

Mechanical Equipment Plans and Service